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May 16, 2018

Ex Parte

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Re: Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz, GN Docket No. 17-183
Expanding Flexible Use of the 3.7 GHz to 4.2 GHz Band. GN Docket No. 18-122
Use of Spectrum Bands Above 24 GHz for Mobile Radio Services GN Docket No. 14-177
Accelerating Wireless Broadband Deployment by Removing Barriers to Infrastructure Deployment, WT Docket No. 17-79

Dear Ms. Dortch:

On May 14, 2018, William Johnson, William Stone, and Charla Rath of Verizon met with Umair Javed, Legal Advisor to Commissioner Jessica Rosenworcel and separately with the Wireless Telecommunications Bureau, International Bureau, and Office of Engineering and Technology staff listed in Attachment 1. On May 15, 2018, we met with Commissioner Michael O'Rielly and his legal advisor Erin McGrath and separately with Rachael Bender, Legal Advisor to Chairman Ajit Pai and Justin McCuen, legal intern in Chairman Pai's office. Also on May 15, 2018, we, along with Tamara Preiss, also of Verizon, met separately with Commissioner Brendan Carr and his legal advisor, Will Adams. In each meeting Mr. Stone provided an update on Verizon's efforts to develop and deploy 5G technology. See Attachment 2.

During the meetings we discussed the significance of the Commission's work on making millimeter wave spectrum available for 5G, and the importance of the Commission's continuing efforts to make more mid-band spectrum available. We outlined the need for the Commission to move quickly to adopt a notice of proposed rulemaking exploring the possibility of making spectrum available for mobile broadband in the 3.7-4.2 GHz band. While expressing support for a market-based approach to making this spectrum available, Mr. Stone stressed that, to be effective, any approach would have to free up well more than 100 MHz.

In addition Mr. Stone discussed the need to reorganize the 39 GHz band before it can be auctioned. We emphasized that the Commission should encourage incumbent licensees to commercially negotiate license swaps to reorganize and rationalize the 39 GHz band as soon as possible. We noted our view that rationalization of this band can occur much more quickly through such market-based efforts rather than through more complex Commission auctions.

In all of the meetings, we also noted the significance of the Commission's ongoing efforts to facilitate broadband infrastructure deployment by addressing regulatory barriers to deployment.

Sincerely,

Attachments

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Attachment 1

International Bureau
Jose Albuquerque
Diane Garfield (via tele-conference)
Michael Mullinix
Jim Schlichting

Office of Engineering and Technology
Bahman Badipour
Martin Doczkat (via tele-conference)
Michael Ha
Nicholas Oros
Aspasia Paroutsas
Jamison Prime

Wireless Telecommunications Bureau
Simon Banyai
Stephen Buenzow (via tele-conference)
Blaise Scinto
Dana Shaffer
Catherine Schroeder (via tele-conference)
Donald Stockdale
Janet Young

Attachment 2

Verizon 5G

Bill Stone

Vice President Network Planning

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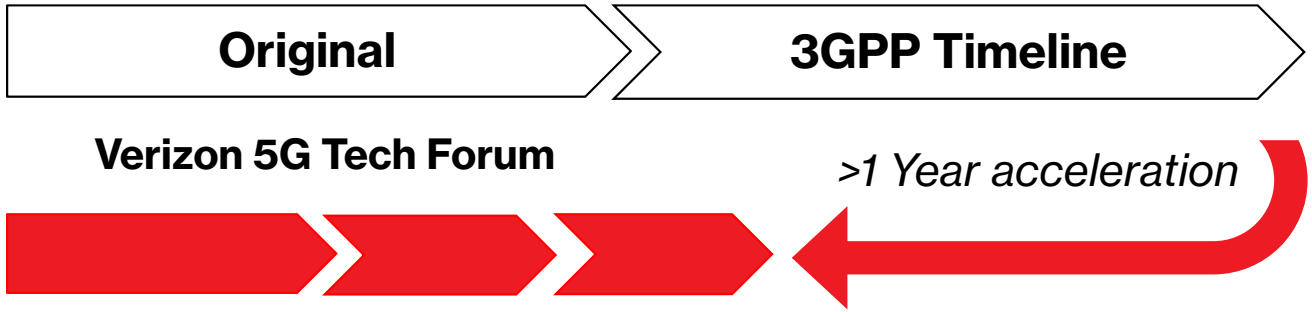
Building the 5G Platform – Standards / Field Trials



- ✓ 5GTF → 3GPP Release 15 acceleration
- ✓ 11 cities customer fixed wireless trial completed successfully
- ✓ Commercial equipment FCC certification mostly complete
- ✓ First 3GPP compliant 5G over the air testing on mmwave for mobility in the U.S.

3-5 cities will launch in 2018

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Building the 5G Platform

Technologies

Digital signal processing to leverage new spectrum bands

Benefits of High Bands

- Small size antenna arrays
- Non-interfering signal forming & tracking
- Wide bandwidth

Benefits of Mid Bands

- Massive MIMO

Passive Infrastructure

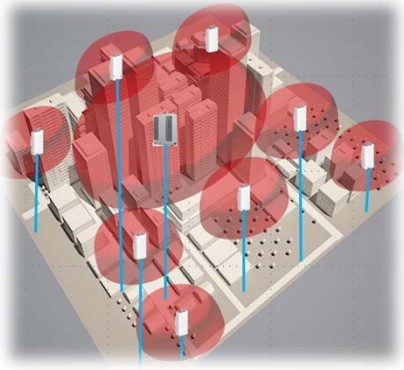
Deep fiber & cell densification deployment collaboration with municipalities

Fiber Availability

- Deep backhaul

Small Cell Density

- Collocation



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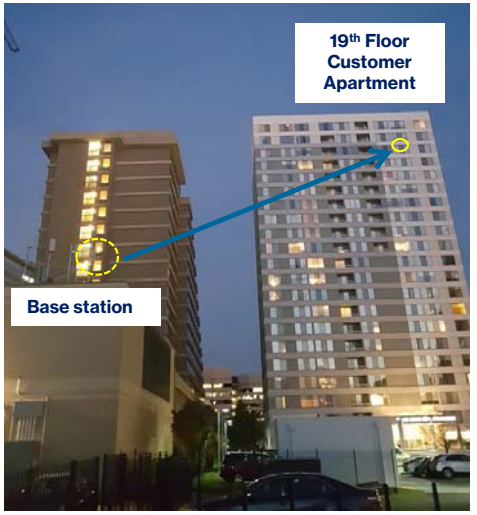
5G Pre-Commercial Trial Results

- Focused on fixed wireless - trial participants were located as far as 2000+ feet from radio and as high as 19th floor
- Success with non-line of site use cases
- Able to achieve data rates over 1 Gbps with wide bandwidths
- Small form factor indoor units
- Option for outdoor antenna
- Real world deployment experience

Line of Sight



MDU Installs

Low-E Glass

Home unit

Optional Outdoor Antenna

Successful trials in 11 markets with mmWave home broadband

5G New Radio (NR) mmWave Deployment

Deployment for mobility

- Integrated radios provide deployment flexibility
- mmWave allows for higher antenna elements
- Decrease in size / weight over sub-6 products
- Can be deployed on various structures

3.5GHz

28/39GHz

5G Opportunities

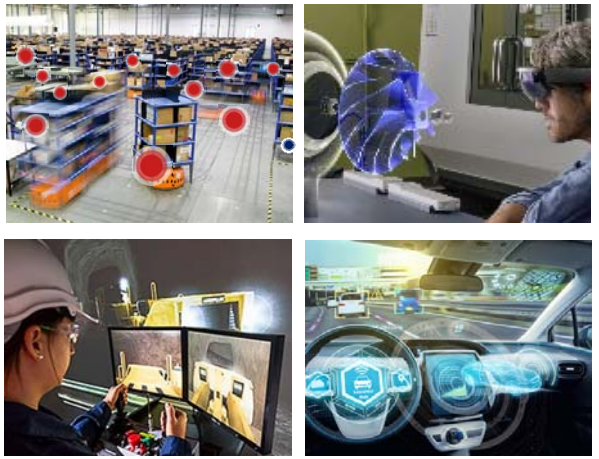
Fixed Wireless

"Quad Play"
Opportunity

Mobile Broadband

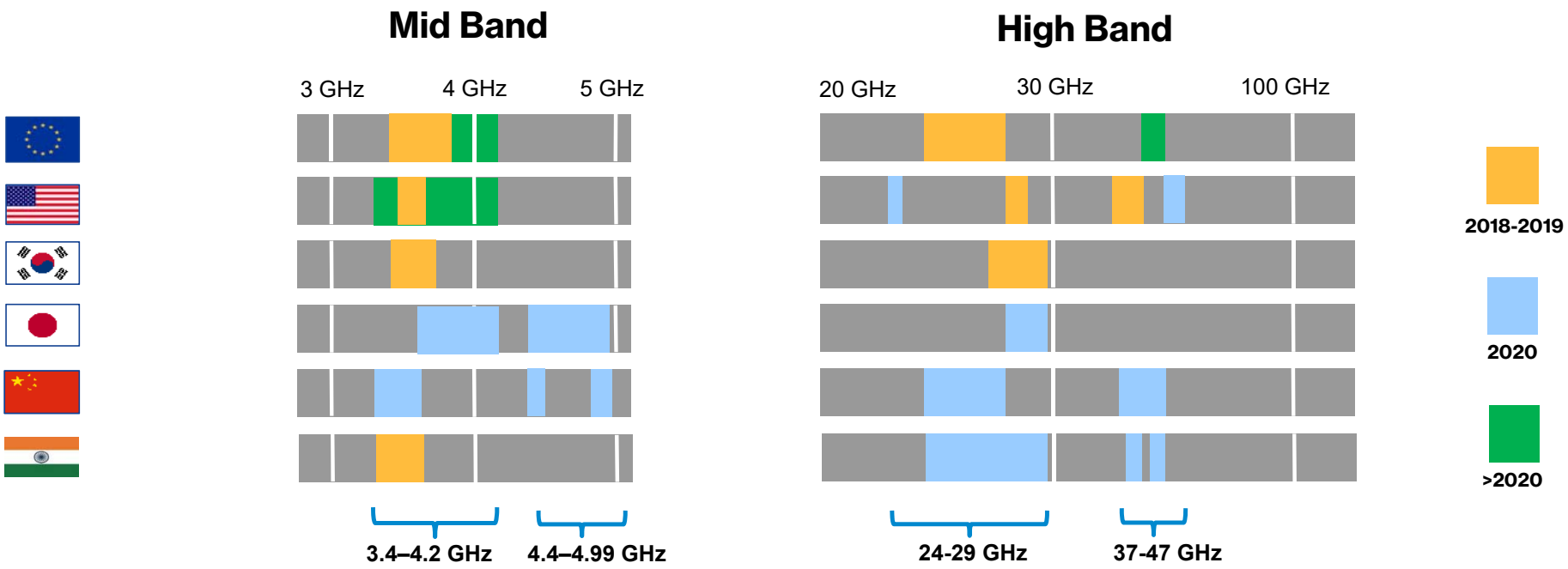
New Consumer
Apps AR/VR

5G-Enabled Cloud



Intelligent Edge/MEC
Industrial Automation

Global Band Planning – 5G.



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Thank You